

A
perfect and

*easy Treatise of the vse
of the coelestial Globe: writ-
ten as well for an Introduction
of such as bee yet vnskillfull in the stu-
die of Astronomie: as the practise of our
Countiemen, which bee exercised in the
Art of Navigation. Compiled by Charles
Turnebull: And set out with as much
paines as the Author could: to
the end it might of euere man
be vnderstoode.*

Psalme. xix.

The heauens declare the glory of God, and
the firmament sheweth the worke of his
hands. Day vnto day uttereth the same, &
night vnto night reacheth knowledge.

Imprinted at London for Symon
Waterfen. 1597.



DEFINITIONS TO BE premised, necessarie for the vnder- *standing of the Globe.*

THe Sphære or Globe, is a perfect round & solid bodie, contained vnder one superficies or face; in whose middle is a point, from which point all lines that are drawne to the superficies and face of the same, are equall the one to the other.

The Center of the Sphære, is the middle point of the same.

The Axe of the Sphære, is a right line passing from one side of the same (by his Center) to the contrary side, about which line the Sphære is carried, but the line it self standeth still.

The Poles of the Sphære, be the endes of his Axe.

The Pole of any Circle, is a point without the compasse of the same, (and yet is equally distant from all points of the circuit or borders of the Circle whose Pole it is:) and from which the same Circle is drawne.



OF THE NAME

of the Sphære, and his diuers
and sundrie kindes of diuisions : together
with the motion of ech one in his kinde.



He name of the *Sphære*, is takē ei-
ther generally or particularly:
Generally & so it is said to con-
taine al perfect rōūd bodies, whe-
ther they be sollid or not: whether
cōtained vnder one onely *Superfi-*
cies or mo. And so may euery Orbe
be called a *Sphære*. But if wee take

the word *Sphæra*, in his particular & proper signification,
then nothing is a *Sphære*, but a perfect rounde bodie being
solide, contained vnder one, &c. as the former definition
declared. This *Sphære* is deuided either according to his
substance, or according to certaine properties and affecti-
ons which he is capable of.

According to his substance he is deuided into two parts:
the one *Elementall*, the other *Æthereall*. The *Elementall*,
containeth the fower Elementes, Fire, Ayre, Water and
Earth: and is subiect to alterations, by reason of their ef-
fectuall working. The *Æthereall* compasseth in round
the *Elementall* part, in his hollownesse, and is lightsome
by nature, and vchangeable: and containeth ten *Sphæres*.
The first and highest from the earth, being called the first
moueable, containeth in his hollownesse all the other: and
by his natural motion is moued directly from the East.

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to the West, and so to East againe, in the space of 24. howers continually, & carrieth about with him by violence, all the other *Spheres*. The next vnder this is the ninth *Sphere*, called the Christall heauen, and by his naturall motion is carried from West toward East, but very slowly, in many yeares passing but one degree: and this motion hath caused the Starres to alter their Longitudes. The third *Sphere* is the Firmament or *Sphere* of the fixed Stars: whose motion by nature is vpon two little Circles: the one being described about the head of *Aries*, and the other of *Libra*: which motion is called the motion of *Trepidation*. The other leauen *Spheres* be of the seauen Planets: the highest of *Saturne*, which moueth by nature frō West toward East, and that in 30. yeares one perfect reuolution. The next of *Iupiter*, mouing from West to East by nature, and that in twelue yeares. The other of *Mars*, making his reuolution from West toward East in two yeares. Vnder *Mars* is the Sunne, mouing by nature from West toward East, making one perfect reuolution in 365. daies and 6. howres almost. Vnder the Sunne is *Venus*, and then *Mercurie*, mouing frō West to East about the same time as the Sunne. The last is the moone, makeing one perfect reuolution from West toward East in 27. daies. 7. howres 43'. 7". yet all these are caried by violence of the first moueable from East to West, as is before saide.

OF THE CIRCLES OF THE SPHERE of Heauen, and of their names, and how they be made.



Astronomers to the ende they might shew the motions of Heauen, and the straunge and wonderfull
conclu-

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conclusions of the *Celestiall* bodies, haue imagined certaine Circles in the bodie of the first *Sphere* or first Moueable, and principally ten: whereof some be greater Circles of the *Sphere*, so called because the Center of these Circles is also the Center of Heauen: and euerie such Circle deuideth the whole *Sphere* into two equall parts. Of this sort be fixe: the *Aequinoctiall*, *Zodiacke*, *Horizon*, *Meridian*, and two *Colures*. Some bee lesse Circles of the *Sphere*, so called, because they haue not the Center of the world for their Center, neither deuide the whole *Sphere* equall. Of this kinde be fower, the Tropicke of *Cancer*, the Tropicke of *Capricorne*, the *Articke* and *Antarticke*.

The *Aequinoctiall*, called the *Aequator*, or girdle of Heauen, is a greate Circle of the *Sphere*, deuiding the *Sphere* into two equall parts, and is equally distant from ech Pole of the worlde: And tooke his name of the *Aequator*, either because it is equally in the middle of Heauen, as *Euclide* saith in his *Opticks*: or for that the Sunne, coming to this Circle, maketh the day and night equall. And it is deuided in 360. equall parts, which partes are called degrees. His Axe is the Axe of the world, and Poles the Poles of the world.

The *Zodiack* is a greate Circle of the *Sphere*, which crosseth the *Aequinoctiall* in two points, the one being the heade of *Aries*, the other of *Libra*, and swarueth from him in all other points, leaning toward ech Pole of the worlde in the point of his greatest swaruing, 23. degrees, 30. minutes. This *Zodiack* is of breadth 12. degrees, and of length, that is to say in compas 360. degrees, and accord-

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ing to his length, is diuided into 12. equall partes, which are called the 12. signes. *Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius* and *Pisces*. And ech signe containeth of length 30. degrees. In the middle bredth of the *Zodiack*, we imagine a Circle to passe, which we call the *Ecliptick* Circle or line, For that when the Sunne and Moone be both vnder this line in a *Diameter*, then the Moone is Eclipsed. Vnder this Circle the Sunne mooueth daily (without declining anie waies) the quantitie of one degree very neare in ech day. The rest of the Planets are found some times on one side the *Ecliptick*, and some time on the other. This *Zodiack* taketh his name of a greeke word signifying a liuing creature: or as the Latens will, is called *Signifer*, for that it beareth the 12. Signes. The Axe of the *Zodiack* and the *Ecliptick*, is all one, being a line diuers from the axe of the world: and the Poles be two pointes alwaies so much distant from the Poles of the world, as the greatest declination of the *Ecliptick* commeth vnto.

A *Colure* doth generally signifie any Circle passing by the Poles of the worlde, and hath his name of his vpperfect shewing himselfe in the motion of heauen. But now by the name of *Colures* we vnderstande two greate Circles, the one going from the Poles of the worlde by the points where the *Aequinoctiall* & *Zodiack* cut the selues (which be called the *Aequinoctiall* points) & is called the *Aequinoctiall colure*. The other passe from the Poles of the world, by those points of the *Ecliptick* which swarue most of all others from the *Aequinoctiall* line (which pointes are called the *Solstitiall* pointes) and this is called the

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the *Solsticiall colure*. And here be you to know that these foure greater Circles which we haue defined, be still the same through the whole world, and are saide to be moueable Circles, for so much as in the motion of heauen, they be also moued: of which, some are moueable perfectly, as the *Aequinoctiall & Zodiack*, (for they in the going about of heauen, do ascend by little & little, til the whole Circle haue gon ouer the *Horizon*) som vnperfectly moueable, as the two *Colures*, which neuer shew the whole Circle in any crooked *Sphere*: the other two greater Circles which followe, be called fixed, for that they neuer moue by the motiō of heauen, but they be changable in euery Region.

The *Horizon* is a greate Circle diuiding the halfe of the Heauen which we see, from the halfe which we see not, and is called in Latine *Finitor*, because it endeth our sight. The *Horizon* maketh fower principal pointes, East, West, North, and South. His Axe is a line imagined to fall from the point of heauen, which is directly ouer our head where we be, downe to the ground like a plumme line, & his Poles be the ends of that line, called the *Verticall* point, and point opposite to the *Verticall*.

The *Meridian* is also a greate Circle, passing from the Poles of the world by our *Verticall* point: cutting the *Horizon* in the North and South points his Axe is a line going from the East point of the *Horizon* to the West, and his Powles be the same points: and these two Circles doe alwaies chaunge, and are diuers in euery Region: for so much as the *Verticall* point of euery Region is diuers, by the which the *Meridian* of necessitie must passe, and is the Pole also of the *Horizon*.

OF THE LESSER CIRCLES OF THE
Sphere, and their names, and of their making.

THe lesse Circles of the *Sphere*, in number befo-
wer. The Tropicke of *Cancer*, the Tropicke of *Ca-
pricorne*, and the two Artickes. The Tropick of
Cancer, is a lesse Circle of the *Sphere*, which is equally di-
stant from the *Aequinoctiall*, lying betwixt the *Aequi-
noctiall* and the North Pole, and touching the *Ecliptick*
in the beginning of *Cancer*. This Circle is described by
the bodie of the Sunne in the longest day of Summer, at
which time the Sunne is entred the solsticial point, or be-
ginning of *Cancer*, and is called the Tropick, of a Greeke
word, which signifieth a returning: because the Sunne be-
ing brought to this point, falleth in his none height, and re-
turneth againe.

The Tropick of *Capricorne*, is a like Circle betwixt the
Aequator and the South pole, and is described by the
Sunne in the shortest day of Winter, at which time the
Sunne is in the beginning of *Capricorne*; whereof it is cal-
led the Tropick of *Capricorne*.

The Artick Circle is a lesse Circle of the *Sphere*, descri-
bed by the Northerne Pole of the *Ecliptick*. *Proclus* saith
it is described by the formost foote of the great beare, and
thereof taketh his name.

The Antarticke is a like Circle described by the South
Pole of the *Ecliptick*, and is called Antartik of the Greeke
word, which signifieth *Opposition*, because it is opposite to
the other.

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OF the vse of the Circles of the Sphere or Globe.

THE most principall cause why Artificers inuented the *Equinoctiall*, was first, because it is the measure of the first heauen, by a conuenient, perpetuall and equall swiftnesse. Secondly, it measureth and limiteth the time of rising of the Signes, as also the length of the Artificiall daies, and times of the *Equinoctials*, with declinations, and right ascensions of Starres, together with longitudes of Regions. Lastly, for the erection of the twelue howsen of Heauen. In like manner, the *Zodiack* serueth for Latitudes and Longitudes of Starres: for distinction of the times of the yeare: for the motions of all the Planets and effectes of the same. Not vnlike be the vse of the *Colure* and *Meridian*, ech showing the greatest declination of the *Ecliptick*, but especially the *Meridian*, which giueth as well all declinations of Starres, their noone height, and distinguisheth the daies and nights into two equal parts, and serueth for the *Horizon* of the right *Sphere*. It beginneth likewise and endeth all Longitudes of Regions, and sheweth Latitudes and Eleuations of the Pole: It helpeth to deuide the 12. howsen. In like maner, sundrie and diuers be the vses of the *Horizon*: As in seperating the hidden part of Heauen, from that which is scene, and sheweth the place of rising and setting of any Starre: how farre from East or West, with his height. All which pointes are respected of Astronomers, as the *Sphere* is secondarily diuided: that is to say, as he is a right, or a crooked *Sphere*, which bee his properties and affections inent in the deuision aforespecified. By a right *Sphere* is ment such a kinde

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of position of Heauen: as that neither Pole bee raised a-
boue grounde, but that ech lye in the face of the earth.
And such a kinde of position haue they which dwell in
Bersera, and the Islands of *Molucca*, or such like. Contra-
riwise, it is saide to be a crooked *Sphere*, when any one
of the Poles is raised aboue ground. Such a *Sphere* haue
we at *Oxford*, and *London*, and generally all which dwell
not vnder the line. All which thinges for our better con-
ceate, are shewed to the eye in the material Globe, whose
names and diuisions appeare at the first vewe; two things
onle being waied, First, that the mechanickall or materi-
all Globe which representeth the first moueable, beareth
in him the fixed *Starres*, (not because the *Starres* be in the
first moueable) but because their motion is so little in
their owne *Spheres* in many yeares, that they may seeme
not to haue moued at all in a mans age from their pla-
ces vnder which they be of the first moueable: therefore
they may bee supposed to stande in it. Secondly, the
Globe representeth the *Starres* to vs in his conuexitie,
which appeare in Heauen in the concauitie. For that our
eye is not in the Globe but without. Furthermore in the
Globe, besides the aforesaid Circles, be found three
others of brasse: the one being a perfect Circle of a little
quantitie, placed aboue the Pole which is eleuated; and
is called the hower Circle, whose stile is called the *Index*.
An other is a thinne rule of brasse, representing one quar-
ter of a whole Circle, called the quadrant of altitude, &c
is alwaie to be fixed (when ye vse the Globe) on the mid-
dle of the halfe of your *Meridian*, which is aboue the *Ho-
rizon*, that is to say, 90. degrees aboue the *Horizon*. The
third

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third and last is a greate halfe Circle lying at the *Horizon*,
seruing aswell for the erection of the scheme of Heauen,
as any Circle of position. All which thinges being adui-
sedly considered of, ye may proceede in the vse of the
Globe, as followeth.

HOW THE GLOBE IS TO BE
placed, readie for his vse and practise.

THe placing of the Globe ought to be such, that the
Horizon of the Globe may stande parallele or leuied
to the true *Horizon*: and the *Meridian* of the Globe
stande in the *Superficies* of the true *Meridian* of Heauen,
and the Poles of the Globe and his *Axe* answer exactly
to the Poles and *axe* of Heauen. Now to the leuying of
the *Horizon*, there ought to bee at your Globe a hanging
plummet, and for the *Meridian*, a Needle touched of the
loadstone, and touching the rectifying of the Poles and
Axe of the Globe, the *Elevation* of the Pole of heauen
is first to be knowen, the meanes to performe, and accom-
plish the same, being such as followe.

Propositio. I.

To finde a Meridian line in any place appointed.

SET vp on your *Horizon* or some plaine leuied boarde,
a *Gnomon* of any reasonable length: then (at such time
as the sunne shineth) describe from the top of your *Gno-*
mon a Circle by the tipe of his shadowe, and make a mark
in the circle where the shadowe ended, at your obseruati-
on which must be before noone, then marke in the af-
ternoone

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afternoone at what time the ende of the shadowe returneth into the same Circle againe, and make a marke at his point of falling: so shall ye haue a portion of the saide circle inclosed betwixt the two points. If then ye deuide this portion into two equall parts, and drawe a line from this middle point, by the point in which the *Gnomon* standeth, it shal be a *Meridian* line.

Propositio. 2.

To take the hight of any Starre.

From the point of Heauen, which is directly ouer our heades (being called the *Verticall* point, or *Zenith*;) are imagined diuers Circles to fall by euery degree and minute of the *Horizon*: all which Circles are called *Verticals*, and serue for the height of Starres, for so much as the altitude of Sunne or starre is the portion of the *Vertical* circle, inclosed betwixt the *Center* of the sunne or starre (in the time of his obseruation) and the *Horizon*: which height is thus found.

Take your *Astrolabe*, and let him hange freely by his ring, then turne vp his *Dioptrall* so long that ye see the starre (whose height yee leeke) thorowe his sights: for then, howe many degrees and minutes are inclosed betwixt the *Dioptrall* and the line of your *Astrolabe*, which is parallele to the *Horizon*, so many hath that starre of height. as the seauenth day of *January*, Anno. 1585. vnder the *Meridian* of *Oxford*, at 9. of the clocke I sought the height of the sunne: taking then my *Astrolabe*, and hanging him toward the sunne, and raising his *Dioptrall* till I espied the sunne, I founde betwixt the *Dioptrall* and the

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the line representing the *Horizon* seauen degrees, and 19. minutes, so much was the height of the sunne at that time.

Propositio. 3.

To take the altitude of the Pole in any place or countrey.

THe altitude of the pole is the portion of the *Meridian* circle inclosed betwixt the Pole and the *Horizon*, & is thus founde. Finde a *Meridian* line, and drawe him in the *Horizon* by the first proposition: then take the height of any fixed starre which setteth not (and that at the forepart of the night) at such time as he is pointed vpon your *Meridian* line, by the second proposition. Againe the next morning, or any other morning, take the height of the same starre at such time as hee is pointed with your *Meridian* line: then subduct the lesse altitude from the greater, and deuide the difference into two equall parts. Lastly, adde halfe the difference to the lesse altitude, so the whole number made giueth the altitud of the Pole. As at Oxford I toke the height of a starre in the fore part of a night in winter, being the tenth of December, 1584. at what time he was pointed with my *Meridian*, and found his height 55. degrees 59. minutes. Againe the next morning I tooke his height and found it 47. degrees 41. minutes. This lesse altitude I subducted from the greater 55. degrees. 59. minutes, and the difference was 8. degrees. 18. minutes, which being parted, had 4. for his halfe and 9. minutes. This halfe added to 47. degrees. 41. min. (the lesse altitude) giueth 51. degrees 50. minut for the true eleuation of the Pole at Oxford.

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Propositio. 4.

To rectifie the Globe perfectly for to be used.

K Now first the eleuation of the pole of Heauen, for the place where yee vse the Globe, by the third Proposition: then erect the Pole of the Globe so many degrees about his *Horizon*, as the pole of heauen is eleuated. Again leuell the *Horizon* of your Globe by his hanging plummet: lastly turne his *Meridian* to the south by help of his Needle, and put his Quadrant of altitude vpon the 90. degree from his *Horizon*: for then the *Meridian* answereth to the *Meridian* of heauen, Axe to axe, & pole to pole as is required. But this way of setting him south, albeit it be of antiquitie, yet hath it imperfection by reason of the variation of the needle: but of that ye shall hear more hereafter.

Propositio. 5.

To finde the place of the Sunne at any time.

BY this place, is vnderstood the degree of the Ecliptick line, in which he is, and this place is thus found. In the *Horizon* of your Globe be set the windes, the signes, and monethes with their daies. finde therefore the day of your moneth in which ye would haue the place of the sunne in the *Horizon* of the Globe. For looke what signe & degree of signe is right against the day, the same is the place of the Sunne. As on the twelfth day of December: Anno 1584. I sought the place of the Sunne: this day being had in the *Horizon*, I founde the first degree of *Capricorne*, 32. minutes to answer against it: and therefore

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fore that was then the place of the Sunne.

Propositio. 6.

To finde the declination of any point of the Ecliptick or of the Sunne at any time.

THe declination of any point of the Eclipticke, sunne, or any starre, is the portion of the *Meridian* Circle, inclosed betwixt the *Aequinoctiall* and the saide point, Sunne, or starre, and is found thus. Turne the point whose Declination yee seeke, to the *Meridian* of the Globe, and there see how many degrees and minutes there be of your *Meridian* inclosed betwixt the saide point and the *Aequinoctiall*. For so much is the Declination. So hath the sunne in the 5. of *Aries* 2. degrees declination. And the 7 of *Taurus*. 13. degrees, 52. minutes. and this declination is called Northren, when the point is of the North side the *Aequinoctiall*, and southerne if of the South side. Here must ye also know, that two points of the Ecliptike want declination, and are the two *Aequinoctials*. Two haue greater declination then any other, and be the two *Solstitialls*. of the rest, fower haue like declination.

Propositio. 7.

To finde the right ascension of the Sunne, or any point of the Ecliptick line.

THe right ascension of any starre, Sunne, or any point of the *Ecliptick*, is the portion of the *Aequinoctiall* Circle from the heade of *Aries*, (where the *Aequinoctiall* taketh his beginning) & that pointe or degre of the same, which meeteth with the saide starre, sunne, or *Ecliptick* point,

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point, vnder the *Meridian* Circle in a crooked *Sphere*, being numbred orderly in the *Aequinoctiall*, and is thus found: turn the starre, sunne, or any point whose ascensioⁿ ye loke, vnder the *Meridian* of the *Globe*, and se then what portion of the *Aequator* is from the head of *Aries* to that point of the *Aequator* which stādeth then vnder the *Meridian*: for the same portion, is the right ascension of the Starre, sun, or point looked for. So do I finde the right ascension of *Bootes* a starre, to be 209. degrees. 1. minut. And the right ascension of the sunne, when he is in the first of *Taurus*, to be 27. degrees. 54. minutes. And the right ascension of the first of *Sagitarie*, to be 237. degrees. 48. minutes.

Propositio. 8.

To finde the crooked ascension of the sunne, starre, or any point of the Ecliptick,

THE crooked ascension of the sunne, is that Arke of the *Aequator* which is inclosed berwixt the beginning of the *Aequator*, and the point of the same which commeth vp with the sunne in a crooked *Sphere*, & is found thus. Take the sunne, starre, or point, whose crooked ascension ye desire, and put him to the East side of the *Horizon* til it touch. Then marke what part of the *Aequator* is inclosed betwixt the beginning of it, and the point now in the *Horizon*: for so much is the crooked ascension of the sunne, starre, or point. So doe I finde the crooked ascension of the sunne in the first of *Taurus*, to be 12 degrees. 48. minutes. All this being in the Eleuation. 52 degrees 0. minut.

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Propositio. 9.

To finde the difference of ascension or increase of the day.

THE Sunne being in one and the selfe same point of the *Ecliptick* (except in the *Equinoctiall* intersections) hath one degree of the *Aequator* that commeth vp with him about the *Horizon* in any crooked *Sphere*; and an other, (not the same) that commeth vp with him in a right *Sphere*. And therefore the portion of the *Aequator*, betwixt the point of the saide, that commeth vp with the Sunne in the right *Sphere*, and the point rising with the same in the crooked *Sphere*, is called the difference of ascension. As in a right *Sphere*, the Sunne being in the first of *Taurus*, theretiseth with him, the 27. degree 54. minute of the *Equinoctiall*. (Which point also meeteth him vnder the *Meridian* in a crooked *Sphere*: for that the *Meridian* of any crooked *Sphere*, sheweth the same that the *Horizon* doth in the right *Sphere*.) but in the crooked *Sphere*, where the Pole is eleuated. 52. degrees, there riseth with the Sunne the same day, the 12. degree 48. minute of the *Aequator*. Subducting now the lesse from the greater, the difference is 15. degrees 6. minutes, and is called the difference of ascension. And because the Artificial day of the crooked *Sphere*, is longer or shorter than the *Equinoctiall* day by twise this difference: therefore the difference of ascension is called also the increase of the day. And this difference is thus found. Find the right ascension of the Sunne by the 7. proposition: and againe finde his crooked ascension by the 9. proposition: then subduct the lesse from the greater, for the remainder is the difference of ascension.

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10.

To finde the length of the Artificiall day in any Region or Country.

FInde out the difference of ascension of the place of the Sun by the 9. proposition, & double the same: then convert it all into hewres & parts of howres, allowing for one hower 15. degrees, and for a halfe 7. degrees. 30. minutes, &c. This time which commeth of the difference of ascension adde to 12. howres (if the place of the Sunne be any degree betwixt *Aries* & *Libra*) or subduct it from 12. if he be betwixt *Libra* and *Aries*; for the number made or left, is the length of the day. As the Sunne being in the first of *Taurus*, his difference of ascension is 15. degrees. 6. minutes: this doubled and converted into time, maketh 2. howers and 12. *Equinoctiall* minutes. And because *Taurus* is a Northren Signe, ye must adde this difference to 12. howers, so do ye make 14. howers and 12. *Equinoctiall* minutes, for the length of that whole day.

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11.

To finde the hower of the Sunne rising, or of his setting.

Nowe the length of the Artificiall day by the 10. proposition, and take halfe of the same day: for that sheweth the hower of Sunne setting. But if ye reckon so much from noone forward, it giueth Sunne rise. As the Sunne being in the first of *Taurus*, the day is 14. howers and 12. minutes. The halfe is, 7. howers and 6. minutes. I say then the Sunne setteth after 7. of the clock,

6 min.

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6. minutes. Again, thus much taken from noone forward, sheweth the sunne to rise before 5. of the clock, 6. minutes.

Propositio. 12.

An other way to finde the same more mechanically.

Finde the place of the Sunne by the 5. proposition, and turne the saide place directly vader the *Meridian*: then put the Index of the lower Circle precisely on 12. of the clock. Lastly, turne the saide place of the Sunne to the East side of the *Horizon*: for when he is there, then shall the Index shewe the time of the Sunne rising. And contrariwise, putting the place of the sunne to the West, it sheweth his setting.

Propositio. 13.

To finde how farre the sunne riseth or setteth from the true East or West point any day.

First finde the place of the sunne by the 5. proposition: then turne the same place to the East side of the *Horizon* till he touch the same: for then the number of degrees in the *Horizon*, (inclosed betwixt the true East point and the place of the sunne,) shewe how farre he riseth and setteth from the true East: and this portion of the *Horizon* is called his bredth of rising: and is called Northern bredth if the sunne rise beyond the East point toward the North, & Southern if contrary. Likewise are ye to know, that of the *Ecliptick* two points *Aries*, and *Libra*, haue no bredth of rising. Two points also as *Cancer* and *Capricorn* haue greater than any other: and of the rest lower points haue the like.

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Propositio. 14.

To rectifie the Index of the lower Circle every day as he ought.

Finde the place of the Sunne every day in which ye vse the Index, by the 5. proposition, & put the saide place vnder the *Meridian*: this being done, then put the Index on 12. of the clocke: for afterward in the motion of the Globe he will goe true as he ought.

Propositio. 15.

To finde the noone height of the Sunne for any day to come, or gone in any place whose eleuation is knowne.

THe height of the Sunne, is the portion of the verticall Circle inclosed betwixt the Center of the sunne and the *Horizon*. But foras much as at noone the *Meridian* and the *Vertical* of the Sunne be all one Circle: therefore his noone height is the portion of the *Meridian* betwixt the Center of the Sunne and the *Horizon*. This height is thus to be knowne. Finde the place of the Sunne for the day promised, & turne the same place vnder the *Meridian*: for then the portion of the *Meridian* betwixt the saide place and the *Horizon* is his noone height. Thus found I the height of the Sunne at noone in Oxford, whose Pole is raised, 51. degrees. 50. mi, on the 5. day of May to be 59. degrees. 47. mi. and on the twelfth of Iune, to be 61. degrees. 41. minuts.

Propositio. 16.

To finde the depression of the Sunne at midnight.

AS the *Meridian* altitude is the portion of the *Meridian*, from the Center of him, to the *Horizon* when

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hee is about the earth: so is his depression the part of the *Meridian* betwixt the Center and the *Horizon* when he is vnder ground, and may thus be knowne . Finde the place of the Sunne, and put it to the *Meridian* vnder the *Horizon*: for then the portion of the *Meridian* betwixt it and the *Horizon*, sheweth his depression. So finde I the depression of the sunne at Oxford (his place being the first of *Taurus*) to be 27. degrees. 40. min. but his place being the first of *Scorpius*, to be 50. degrees. 0. min.

Propositio. 17.

To finde what height the Sunne shall haue at any certaine hower of any artificiall day.

TAKE the place of the sunne by the 5. proposition: & rectifie the Index by the 14. prop. then turne the Globe, till the Index of the hower circle be on the hower for whome ye desire the height of the sunne, and stopping the Globe there, put the quadrant of altitude to the place of the Sunne: for his portion betwixt the place of the sunne & the *Horizon*, giueth his height. So finde I the height of the sunne at Oxford, at 9, of the clocke the 7. day of March. to be 24 degrees. 25. min. and at one of the clocke the same day to be 34. degrees. 51. min.

Propositio. 18.

By any height of the Sunne giuen and his place, to finde the hower of the day.

LET it bee, that either ye take the height of the sunne at some time of the day by the second proposition: or that ye haue some height of him giuen by supposition, and

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and ye would know by it what it is of the clocke that day at that time. Finde therefore the place of the sunne for that day, by the 5. proposition, & rectifie the Index by the 14. proposition. Lastly put the place of the sunne to the Quadrant of Altitude, and mooue them both vp and downe, till ye allow him the same height in your Quadrant, as ye found or supposed him in truth to haue. For then the Index of the lower Circle sheweth what was or is of the clock: as finding the height of the sunne before Noone on the seauenth of March at Oxford, to be twentie lower degrees. 25. min. I found it to haue beene then nine of the clocke.

Propositio.

19.

By the lower knowne, and the height of the Sunne at that lower, together with the Index rectified as he ought, to finde the place of the Sunne at that time.

Mooue your Globe till his Index stand on the lower which was knowne before. Then fixe the Globe for remouing: Lastly turne your Quadrant of altitude to the Ecliptick line, and looke what degree of the Ecliptick agreeth in your Quadrant with the height that was before knowen, and that is the place of the sunne on that day.

Propositio.

20.

The lower and place of the sunne being giuen, to finde how farre the sunne is gone from the true East point.

The place of the sunne being giuen by supposition, rectifie the Index by the 14. proposition: then turne the Globe till the Index shew the lower giuen. This being done, fixe the Globe that he mooue not away, and
set

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set the edge of the Quadrant of altitude to the place of the Sunne: and withall marke howe many degrees of the *Horizon* are inclosed betwixt the true East point, and the edge of the Quadrant, at such time as he standeth on the place of the sunne: for so much is hee distant in the *Horizon* from true East.

Propositio. 21.

The distance of the Sunne being given frō true East, together with his height at the same time, & the height of the Pole for the same region: to finde the true place of the Sunne, at any time.

TO the ende we make not vnneccessarie repetitions of the first principles, know this, that in all the propositions following, we alwaies suppose before the working, the Globe rightly rectified as is specified in the beginning. For the performance therefore of this practise, first consider diligently in what quarter of the yeere ye be in, that is, whether it be betwixt the *Aequinoctiall* of March, and height of Summer: or betwixt the height of Summer, & *Aequinoctial* of September. Likewise whether betwixt *Aequinoctiall* of September & depth of Winter: or betwixt depth of winter & *Aequinoctial* of March. For then set the edge of the Quadrant of altitude at the true distance of the Sun frō the East, & turn the Globe til that quarter of the *Ecliptick* com vnder him, which serueth for the quarter of the yeere in which ye be & se what degree of that part of the *Eclip*-agreed with the height proposed: For that is the place of the sun at that time. Note therfor here, that to the Spring (which is frō the *Aequinoct.* of March til the height of Summer) answereth the part of the *Zodiack* frō *Aries*

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to *Cancer*, To summer, which is from the height till the *Aequinoctiall* of September, answereth the part frō *Cancer* to *Libra*. The *Autumne* is guided by the quarter from *Libra* to *Capricorne*; and Winter by the signes from *Capricorne* to *Aries*.

Propositio. 22.

The distance of the Sunne being giuen from true East, and the place of the same: to finde the height of the sunne which he hath at the same time.

PLace the quadrant of altitude at the true distance frō East, so shal he cut the place of the sunne by the 21. proposition: and therefore the portion of the Quadrant betwixt the place of the sunne and the *Horizon*, is his height.

Propositio. 23.

The distance of the sunne from true East being giuen, & his place: to finde the hower of the day.

First hauing his place, rectifie your Index by the 14. proposition: again setting the Quadrant of altitude on the distance from true East, reduce the place of the sunne till he fall in the edge of the Quadrant: for then the Index doth shewe the hower.

Propositio. 24.

The distance of the sunne being giuen from true East, and his height, to finde the time of his rising.

THe distance being giuen, finde his place by the 21. proposition: and then rectifie the Index by the 14. proposition

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sition: Lastly put the place of the Sunne to the East side of the *Horizon*: for then the Index wil shew the Sunne rising.

Propositio. 25.

The distance of the Sunne being giuen from true East, and his height, to finde his Declination.

THe distance being giuen, his place is found by the 21. proposition: & his place being knowne, giueth his Declination by the 6. proposition. So may wee likewise by the saide distaunce (finding his place) finde his right or crooked ascention, or difference of ascentions, and length of Artificiall daies.

Propositio. 26.

The declination of the Sunne being knowne: to finde the Place of the Summe.

CONSIDER first diligently in what quarter of the yeare you be in, as was expressed before: then take that quarter of the *Ecliptick* which answereth to your quarter of the yeare: and moue it still vnder the *Meridian* of your *Globe*, till ye finde no more of the *Meridian* inclosed betwixt the *Aequator* and *Ecliptick*, than the declination that is giuen cometh vnto: for then looke what degree of the *Ecliptick* is vnder the *Meridian*, that is the place of the Sun. As the declination of the sunne in the quarter of the yeare betwixt the *Aequinoctiall* of March, and height of summer was giuen to bee 11. degrees. 50. minutes. And to this quarter of the yeare, answereth the quarter of the *Ecliptick* from *Aries* to *Cancer*. Therefore
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moving the said quarter vnder the *Meridian*, I found the first of *Taurus* to answer to this declination: and therefore that was the place of the Sunne.

Propositio. 27.

The declination of the Sunne being knowne, to finde the day of the Moneth.

BY the declination giuen, finde the place of the sunne by the 26 proposition: then take the saide place in the *Horizon* of your Globe: for looke what day answereth against it, that is the day of the Moneth.

Propositio. 28.

The day of the Moneth being knowne, to finde the length of the Planetarie hower.

THe Artificiall day is from Sunne rise to Sunne set: and the 12. part of this day, whether it be longer or shorter then an hower by the clocke, is the Planetarie hower: and may thus be knowne. The day being giuen, finde the length of that day by the 10. proposition: and deuide al by 12. The *Quotient* is the length of a Planetarie or Artificiall hower of that day. As the day being 16. howres by the clocke, I deuide it by 12. the *Quotient* is one hower & a quarter, & so much is a Planetary hower of that day.

Propositio. 29.

The day of the Moneth being giuen, to finde the dawning of the day.

By

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BY the day knowne, finde the place of the sunne by the 5. proposition: and then rectifie your index by the 14. proposition. Again take the degree of the *Ecliptick* which is opposite in a Diameter to the place of the sunne, and move him toward the West together with the Quadrant of *Altitude*, till ye haue 18. degrees of height: for then the Index sheweth the beginning of the dawning or spring of the day.

Propositio. 30.

To finde the length of the whole dawning.

FInde the beginning of the dawning by the 29. proposition, and then the Sunne rise by the 11. or 12. proposition: for the difference of those times is the whole dawning. And thus farre haue I followed such conclusions, as haue a more orderly coherence: it remaineth now to shew some others, whose coherence is not so naturall.

Propositio. 31.

An other way to finde the length of the Artificiall day or night.

FInde the time of the sunne rising for your day proposed by the 12. proposition: then double all those howers & partes of time which be from sunne rise till noone: for it giueth the artificiall day. Or if ye number all the howers and parts from sunne rise to his setting, it giueth the same.

Propositio. 32.

To finde the hower of the day.

PLace the Globe in the sun shine, & rectifie him to his
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by the 4. proposition, then finde the place of the Sunne by the 5. proposition. Againe, rectifie his Index by the 12. proposition. Lastly set an needle or pinne directly vp in the place of the sunne; then turne the Globe vp till the pinne cast no shadowe, for then the Index sheweth what is then of the clocke.

Propositio. 33.

To finde the eleuation of the Pole, in any place.

DRawe in the open ayre vpon some table that is leuel, a *Meridian* line by the 1. proposition, and place the Globe so on it, that his *Meridian* Circle hang directly ouer it; then hauing the place of the sunne, set a pinne right vp in it, and put the saide place and pinne close to the *Meridian* circle. Lastly, lift vp the Pole and *Meridian* Circle, till the pin cast no shadowe; for then the degrees betwixt the Pole and the *Horizon*, be the true eleuation of that place. But this practise is to be performed at noone onely or height of the day.

Propositio. 34.

An other way to doe the same.

TAke the height of any fixed starre (whome ye know) by the 2. proposition, at such time as he pointeth with the *Meridian* line; then take the same starre on the Globe, and by helpe of your *Quadrant* or *Meridian* Circle, cause him to haue the same Altitude in the Globe and withall to be vnder the *Meridian* of the Globe: for then is the Pole at his true Eleuation. So did I finde the Pole starre (making my obseruation at Oxford, the 11. of Decem.

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December 15 8.4.) by the plaine *Sphere*, to haue 55. degrees. 59. minuts in Altitude, being then the *Meridian* of Heauen: and when I set him at the same in my *Globe*, I found the Pole eleuated there 51. degrees. 50 minuts. And here ye are to knowe, that whensoever ye haue by any way, the eleuation of the Pole in any place: if ye subduct the same eleuation from 90. degrees, it shall leaue & shewe the eleuation of the *Aequator* in the said place. So then the eleuation of the *Aequator* at Oxford, is 38. degrees. 10. minuts.

Propositio.

35.

An other way of working the same, with more precisenes;
First learne by some good *Ephemeris* the precise place of the sunne at noone in the day of your obseruation: then againe learne that extract declination of the said place. Lastly, with your instrument take the *Meridian* height of the sunne that day. And if the declination bee Northerne, then subduct it from the *Meridian* Altitude: but if it be Southerne, then adde it to the *Meridian* Altitude: so shall we bring forth the Altitude of the *Aequator*: & this altitude being subducted fro 90. degrees, leaueth the Altitude of the Pole: but if the sunne in the time of obseruation be in the *Equinoctiall* point, then is the *Meridian* Altitude the Altitude also of the *Aequator*, and it subducted from 90. degrees, leaueth the Altitude of the Pole.

Propositio.

36.

To make an Horizontall Diall by the Globe.

A *Horizontall Diall* is such a one as is made in a plaine *Superficies*, and lyeth leuell with the *Horizon*.
For

The vse of the Globe.

For making whereof ye are to consider, that from one Pole of the globe to the other go twelue great Circles, called hower Circles, and deuide the *Aequator* into 24. equal parts: And two of these be two *Colures*. Put therefore the *Solstitiall Colure* precisely vnder the *Meridian* of your Globe, (the Globe being first perfectly rectified) and fixe the Globe so that he cannot mooue. Now marke how many degrees of the *Horizon* are inclosed betwixt the *Meridian* and the next hower Circle toward the East (which for distinction sake I call the second hower Circle) so likewise betwixt the first and third, the first & fourth, the first and fifth, the first and sixt, the first and seauenth (which is he that cutteth in the true East point) & set the all downe in tables: then drawe on some plaine thing a Circle, and deuide it into fower quarters, by drawing two crosse lines: Now take the one end of any of the two lines, and tearme it the North point, so shall his other end be the south point, and the endes of the other line East & West. Againe, deuide that quarter of this Circle which is betwixt the North point and East into 90. equall parts, & let 90. stand at the East. So doe by the quarter betwixt North & West. Lastly, reckon frō the North point toward East, so many degrees as your tables shew to haue bin betwixt that first & the second hower line: & frō the point where they end drawe a line by the Center of the saide Circle. and so do by all the numbers of your tables: for so shall ye haue your hower lines drawne for a *Horizontall Diall*. In whose Center must be a stile erected, according to the eleuation of your Pole. But this I leaue obscure, as meaning to set out an ample treatise of dialling by it selfe.

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Propositio.

37.

How the starres may be knowne by the Globe of Heauen.

REctifie your Globe in the open ayre by the 4. proposition: then take the height of any knowne starre by your instrument: afterward looke the same starre on the Globe, and by helpe of your Quadrant of Altitude put the same starre at his height taken before, and in the same Coast, & then fixe the Globe. Now if ye would know any other starre of heauen, then take the same starre his height with your Instrument: lastly, turne your Quadrant of altitude toward the same Coast of the Globe in which the starre was in, & looke what starre ye finde in that Coast, to haue that altitude, the same is he whome ye seeke. The like is to be done by all others.

Propositio.

38.

To finde the Longitude of any fixed starre.

THe Longitude of a starre, is the portion of the *Ecliptick* line, taken from the heade of *Aries*, (according to the order of the signes) to the point of the *Ecliptick*, cut by a Circle, which passeth from the Pole of the *Ecliptick* by the Center of the saide starre; & is thus found. Take the Globe from his *Horizon*, and take of his *Meridian* Circle, and fixe the same Circle by some meanes on the Poles of the *Zodiack*: then turne the starre whose Longitude ye seeke, vnder the Circle: and reckon all the Signes and parts from the head of *Aries*, to that point of the *Ecliptick* which is vnder the Circle with the Starre:

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for so much is his longitude. And the same point of the *Ecliptick* which is so vnder the Circle, shalbe called the place of that starre. And the starre is saide to be vnder that signe, of whome the aforesaide point is a part. The Longitude may also be taken, if ye do but fixe the *Quadrant* of *Altitude* in the Pole of the *Ecliptick*, and stirre not at all the *Meridian* Circle.

Propositio. 39.

To finde the Latitude of any starre.

THe Latitude of a starre, is the portion of the Circle that passeth from the Poles of the *Ecliptick* line, by the Center of any starre, which is inclosed betwixt the *Ecliptick* line and the Center of the starre, and is founde thus. Your Circle standing in the Poles of the *Zodiack* as before, turne the starre vnder the saide Circle: for then the portion of that Circle betwixt the starre and the *Ecliptick*, is his Latitude. And this Latitude is Northern, when the starre is North from the *Ecliptick*; and southern, if contrary.

Propositio. 40.

To finde what starres be aboue ground at any time of the day or night.

IF ye wold know it in the day time when the sunne shineth, then take the height of the sunne by the 2. proposition: afterward finde his place by the 5. proposition: lastly, by helpe of the *Quadrant* of *Altitude*, set the sun at his owne height and Coast, and then all the stars about the *Horizon* doe appeare in the Globe. Now if it be in the

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the night, and the starres appeare; then take the height of some knowne starre, and place the same starre at his due height in the Globe, so shall ye see the same.

Propositio. 41.

To doe the same without Sunne, or appearance of any Starre.

YE must know what it is of the clocke at that time when ye would worke this conclusion: then rectifie the Index by the 14. proposition: Lastly; turne the Globe till the Index come on the same hower as is giuen by the clocke, for then the starres appeare as they should.

Propositio. 42.

To finde what Starres will passe directly ouer our heads in the motion of the Heauen.

After that the Quadrant of Altitudes is fixed in his due place, as is spoken of before, so that he now doe shewe the Zenith or Verticall point: then moue aboute the Globe, and marke what starres passe vnder the Zenith in this motion; for those bee such as goe by our heades, & are called sometimes *Culminant* starres, sometimes *Verticall* starres, and haue their chiefest vse in Astrologie.

Propositio. 43.

To know with what degree of the Ecliptick any Starre riseth, cometh to the Meridian, or setteth.

Moue the Globe till the starre, whom ye propose, ascend about the Horizon, and then marke the degree of the Ecliptick that riseth with him. Againe moue him

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him to the *Meridian*, and marke the degree of the *Ecliptick*; so doe by him in the West side of the *Horizon*, & ye shall haue your intent.

Propositio. 44.

To know the hower of any Starres rising.

REctifie the Index by the 14. proposition, then turne the Globe till the saide Starre (whose time of rising ye desire) touch the East side of the *Horizon*: for then the Index giueth his time of rising. And if ye turne him to the *Meridian*, the Index will shewe his time of comming thither: or if ye turne him to the West side of the *Horizon*, the Index sheweth his setting.

Propositio. 45.

To finde in how long time any whole signe ariseth.

REctifie the Index by the fowerteenth proposition: then put the beginning of the signe (whose time of rising ye seeke) to the East part of the *Horizon*, & marke what the Index standeth on then: againe, put the last degree of the saide signe to the *Horizon*, and see what the Index sheweth: for the difference of the two times by the Index, is the time in which that signe riseth.

Propositio. 46.

To finde in what coast any Starre is, and how many degrees from the Meridian.

Finde the Starres aboue ground by the 20. proposition: then the Globe beeing fixed, put the Quadrant of altitude to any Starre. Then shall the foot of the Quadrant shewe

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Shewe in the *Horizon*, how farre the same starre is from East, West, North or South. But if ye first rectifie your Index by the 14. proposition, and then finde the starres about by the 20. proposition; again at the same time marke where the Index standeth: lastly put any starre vnder the Meridian, and againe note the standing of the Index: the difference of these two times shewed by the Index, is the distance of that starre from the *Meridian*, in time of your obseruation.

Propositio. 47.

To finde what Starres rise or set any day, Cosmically, Achronically or Helically.

Such starres as bee neare to the sunne in any day, and ascend above the *Horizon* a little before the appearance of the same, are saide to rise helically: and such starres as set very little after the Sunne, are saide to set helically. Again such starres as ascend together with the Sunne, and such as set at the same time, are said to rise and set cosmically. Lastly, such starres as set together with the sunne, and such as rise at the same time, are said to set and rise achronically: and such may bee thus found. Rectifie the Index by the 14. proposition: and turne the place of the sunne to the East side of the *Horizon*: for the starres going immediately before the Sunne, rise helically, and those in the *Horizon* rise cosmically: and they that are in the *Horizon* in the west doe set cosmically, and such as immediately rise after the Sunne, doe sette helically. Lastly turne the sunne to the West point of the *Horizon*, and looke what starres touch the *Horizon* with him,

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Such set achronically: and such as are at the same time rising in the East, rise achronically.

Propositio.

48.

To knowe the hower of the night, at any time by the Starres.

Rectifie the Index by the 14. proposition, then againe finde what starres bee above ground at the same time, when ye would knowe the houre by the 40. proposition: for then the Index will shew the hower.

Propositio.

49.

To finde the fower Cardinall points of heauen at any time of day or night.

The fower Cardinall points, be the fower degrees of the Ecliptick, where of one is in the East rising; another is in the South or vnder the *Meridian* above at the same time: the third in the West setting, and the fourth vnder the *Meridian* beneath ground, all at one instant, in the time of any geniture, or motion of any question, and are thus knowen. If yee seeke them in the day (the Sunne shining) then finde the starres above ground by the 40. proposition: and with all make the degree of the Ecliptick in the East, so likewise in the South, West and North: for those be then the Cardinall points. Again if it be in the night, then finde the starres above by the same 40. proposition, and the pointes shall likewise appeare. Lastly, if neither the Sunne shine or starre, then knowe the hower by the clock, and afterward finde the starres above ground at the same hower by the 41. proposition: so shall the pointes be geuen as before.

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Propositio. 50.

To finde the bignes of the angle made betwixt the Meridian Circle, & any circle of position.

Circles of Position bee all such, as are drawne from the North point of any *Horizon* by the Center of any starre, & so to go to the South point of the same *Horizon*, to returne to the North againe. And every one of these Circles doth make some with the *Meridian*, & the said Angle hath his bignes shewed by a portion of the fixed verticall: so that to finde the bignes of the angle made betwixt the *Meridian* and any circle of position, is to finde the portion of the fixed verticall, inclosed betwixt the *Meridian* & the saide Circle of position: that portion is thus founde. Put your Quadrant of altitude to the true East point, then raise vp your brasse halfe Circle as heigh aboue the *Horizon* as yee please, so that it may now represent some Circle of position: for then the degrees of the Quadrant of altitude from the *Meridian* to this Circle, be the bignes of the angle made betwixt the *Meridian* & the Circle of position: but yf your Circle of position fall on the West syde of the *Meridian*, then put the Quadrant to the West point, & worke as before;

Propositio. 51.

To fynde the beginning and ends of the 12. houses of Heauen.

Concerning the erecting the Scheme of heauen, or (as we commonly call it) the twelve howsen, though sower diuers waies haue bene receied, touch-

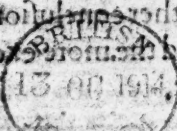
ing the house how they ought to be taken, yet it is not our intent to descourse of that question, but to shew how they ought to be erected according to the most vsuall way set downe by *Regiomontanus*, and called reasonable: wherefore first ye are to know, that in any *Horizon* wherefoeuer we be we doe imagine fixe Circles to be drawn from the North point of the *Horizon* to the South of the same, and deuiding the *Aequinoctiall* into twelue equall parts; and the twelue spaces betwixt these Circles are called the twelue houses (and two of the fixe Circles are alwaies the *Meridian* and *Horizon*) in euery one of these houses is inclosed some portion of the *Zodiack*; and one portion is greater then an other, so that to erect the twelue houses, is to find out the portion of the *Ecliptick* inclosed in each space, and to do it we thus proceed. First finde out the foure Cardinal points by the 49. proposition, for those be the beginnings of foure houses of the twelue: the cardinall point vnder the *Meridian* aboue ground, is the beginning of the tenth house. This done, fixe the Globe, then reckon from the degree of the *Aequator* (being then vnder the *Meridian*) 30. degrees toward the East point, and raise vp your brasse halfe Circle to stand on the point of the *Aequator*, on which yee left. For looke then what degree of the *Ecliptick* is cut then by the brasse halfe circle, the same is the end of the tenth house, and beginning of the eleuenth. Againe yet reckon 30. degrees more in the *Aequator* toward the East, and put the brasse halfe circle to it, and then take the degree cut in the *Ecliptick*; for that is the end of the eleuenth house and beginning of the twelfth. Againe the Cardinall point

The use of the Globe.

point of the East is the end of the twelfth house, and beginning of the first house. Now if in like sort ye goe from the degree of the *Equator* vnder the *Meridian* and by each 30. degrees of the same toward the west point, and still obserue the degrees cut in the *Ecliptick*, yee shal haue the beginnings and ends of the ninth, eight, and seuenth house. Thus hauing erected fixe housen, the degrees of the *Zodisack* which are opposite to these in a *Diameter* (one to another) be the beginnings and ends of the other fixe howsen, which were to be found. And heere must ye note, that the first house beginneth at the East point, and goeth vnder the ground toward the *Meridian* circle, the second & the third succeed the fourth, beginning at the *Meridian* vnder ground comining toward West; the fifth & sixth succeed, the seauenth beginneth in the west and goeth aboue ground toward the *Meridian*, the eight and nynth succeed. Other conclusions lesse profitable I wittingly auoided: and the more excellent deferred to a more conuenient time.

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point of the East is the end of the twelfth house, and be-
 ginning of the first house. Now it is like four yegod non
 the degree of the Equator under the Axiom and by
 each 30 degrees of the same toward the west point, and
 still of the degrees in the Equator, yegod non
 the beginning and end of the ninth, eighth, and seventh
 house. Thus having erected five houses, the degrees of
 the Zodiac, which are opposite to the 15 in a D. water
 (one to another) be the beginning and end of the other
 six houses, which were to be found. And here must
 we note that the first house begins at the East point,
 and goes under the ground toward the West, which circle,
 the second & the third succeed the fourth, beginning at
 the Axiom and the ground coming toward West, the
 fifth & sixth succeed the seventh beginning in the west
 and goes above ground toward the Axiom, the eighth
 and ninth succeed. Other calculations less profitable
 and wittingly avoided: and the more excellent defined as



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